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Fischer et al.

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[45] **Date of Patent: *May 9, 2000**

[54] **CANOPY LUMINAIRE**

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[73] Assignee: **LSI Industries Inc.**, Cincinnati, Ohio

[*] Notice: This patent is subject to a terminal disclaimer.

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[22] Filed: **Jul. 9, 1997**

Related U.S. Application Data

[63] Continuation of application No. 08/532,901, Sep. 22, 1995, Pat. No. 5,662,407.

[51] **Int. Cl.**[7] **F21S 1/02**

[52] **U.S. Cl.** **362/147**; 362/365; 362/368; 362/226; 362/375

[58] **Field of Search** 362/147, 148, 362/145, 288, 150, 364, 365, 368, 374, 375, 440, 226; 248/343, 27.1, 27.3

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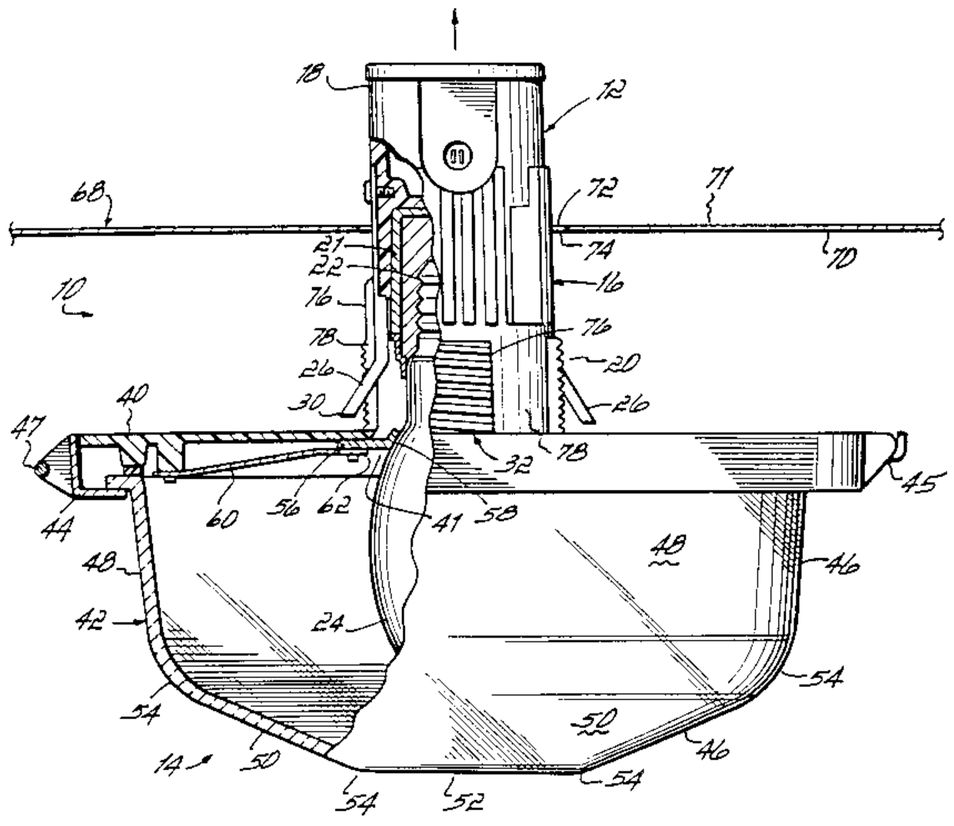
Primary Examiner—Thomas M. Sember

Attorney, Agent, or Firm—Wood, Herron & Evans, L.L.P.

[57] **ABSTRACT**

A canopy luminaire (**10, 110, 210**) for mounting by a single individual in a canopy comprises a luminaire housing (**12, 112, 212**) having a bulbous body (**14, 114**) configured to receive the light-emitting section of a lamp and a narrow neck (**16, 116**). Spring clips (**26, 124**) are secured to opposing sides of the narrow neck (**16, 116**) and are adapted to support the luminaire (**10, 110**) from a canopy. A locking component (**31**) may be attached to the narrow neck (**16, 116**) to fixedly secure the luminaire (**10,110, 210**) to the canopy. The luminaire (**10, 110, 210**) may also include externally mounted control gear (**80**), such as the ballast. Further, the luminaire (**10, 110, 210**) may include a hingedly attached glass lens (**42**) to permit quick and easy replacement of lamps. Alternatively, luminaire (**210**) may include a rotatably attached glass lens (**240**).

59 Claims, 8 Drawing Sheets



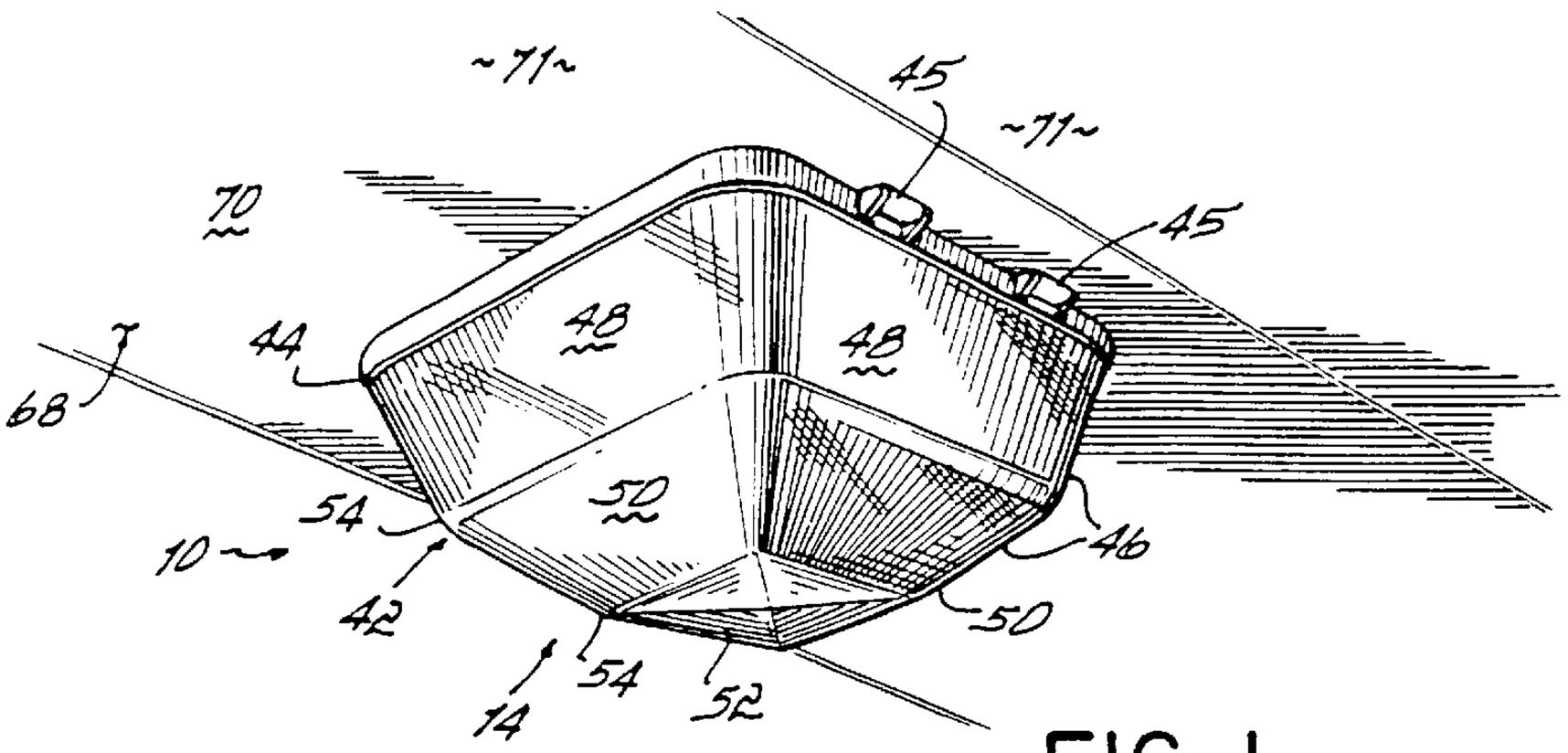

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FIG. 1

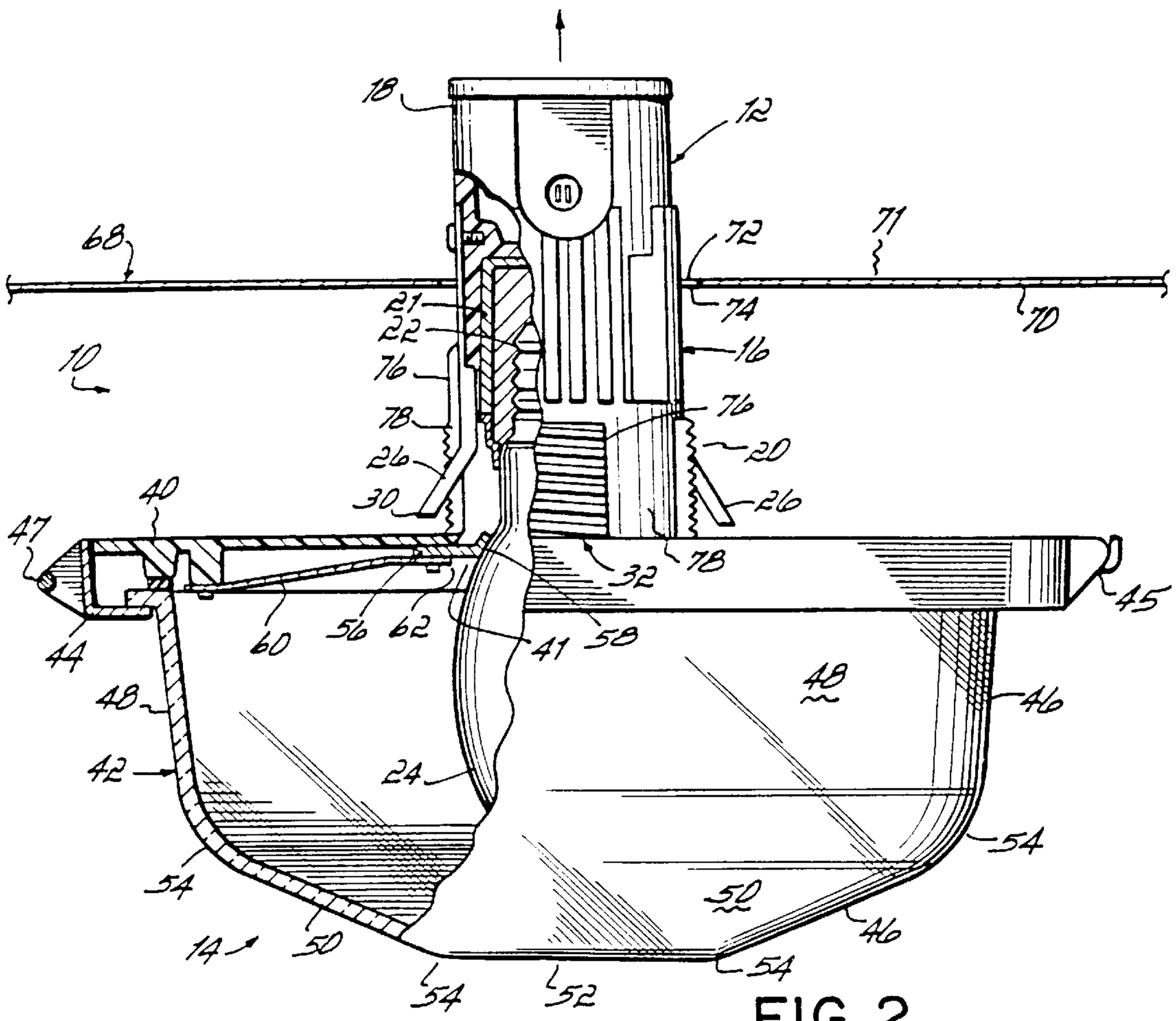
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FIG. 2

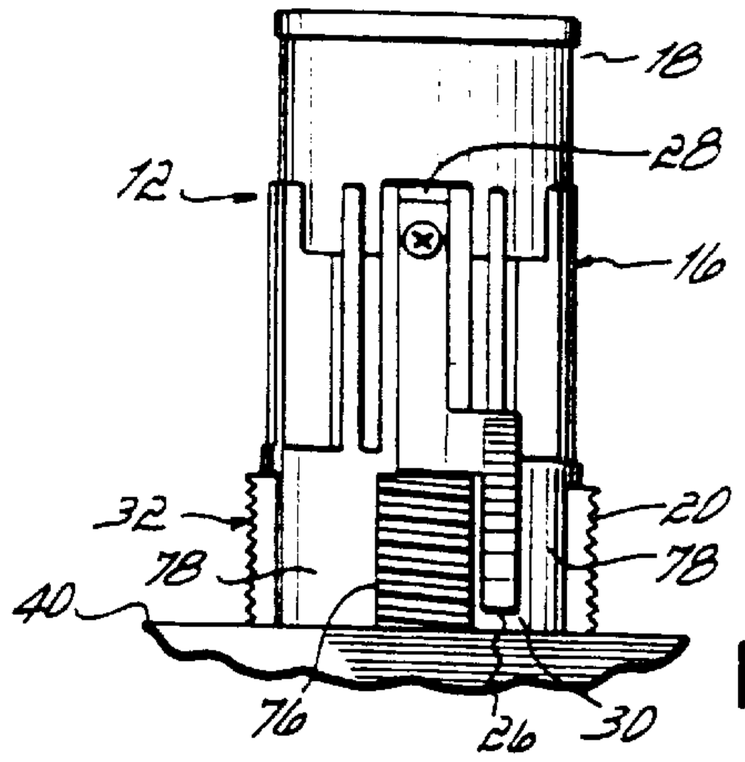
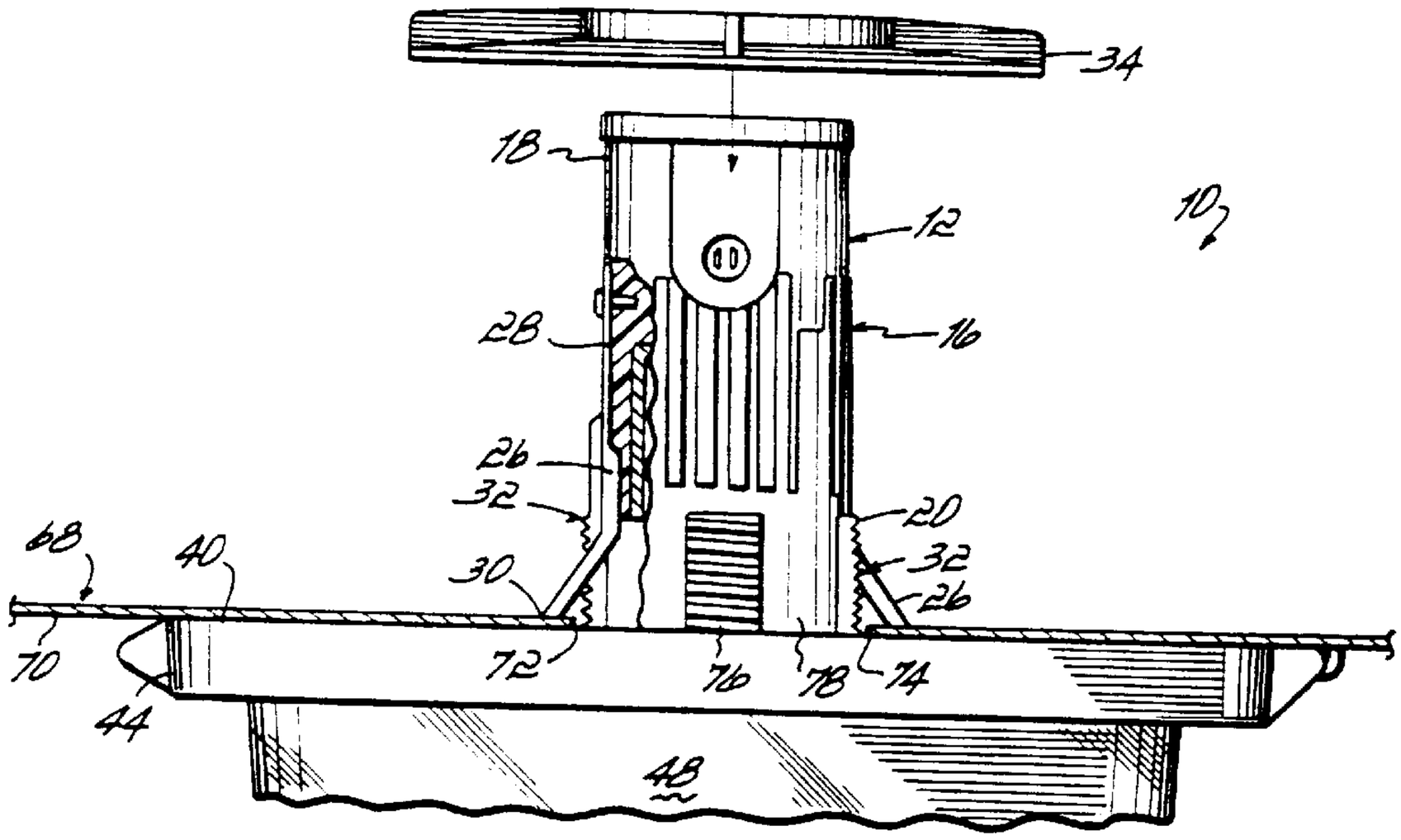


FIG. 3



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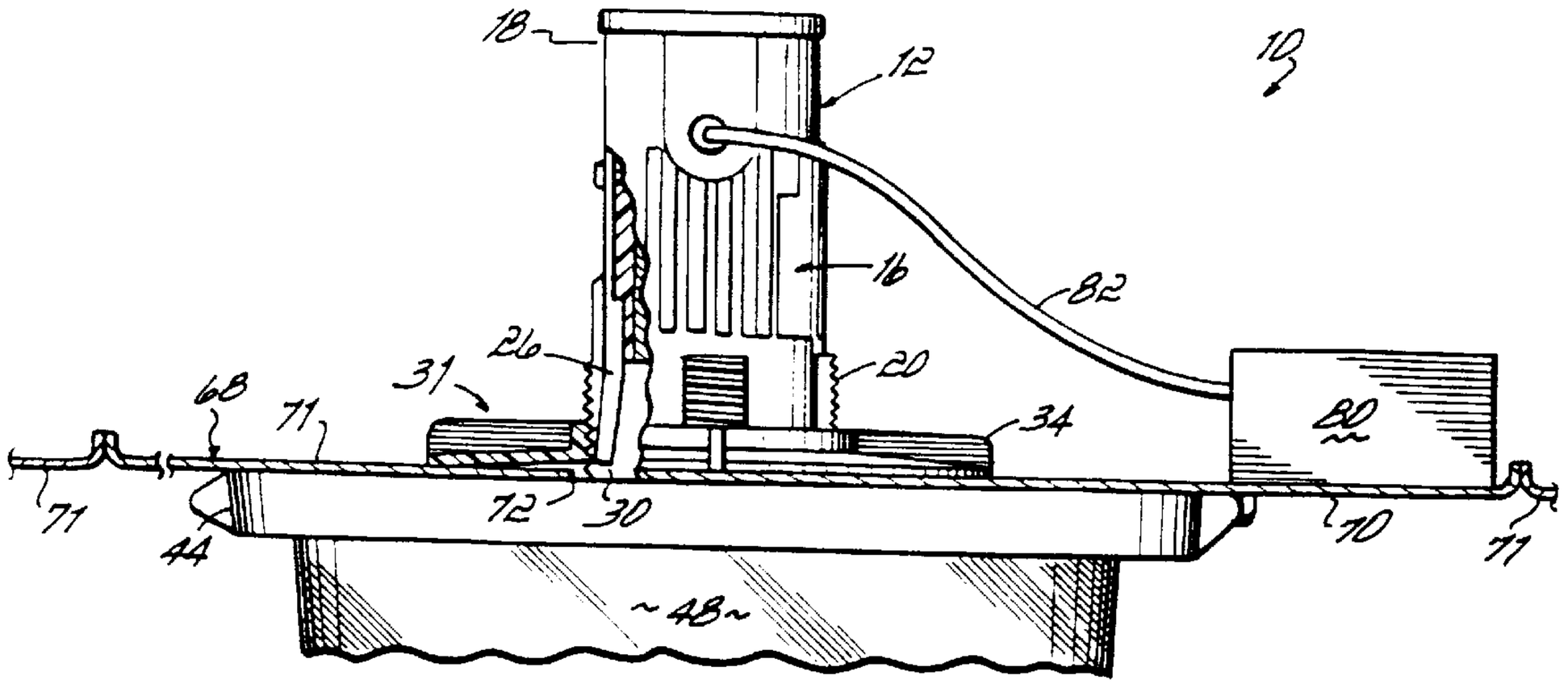

FIG. 5

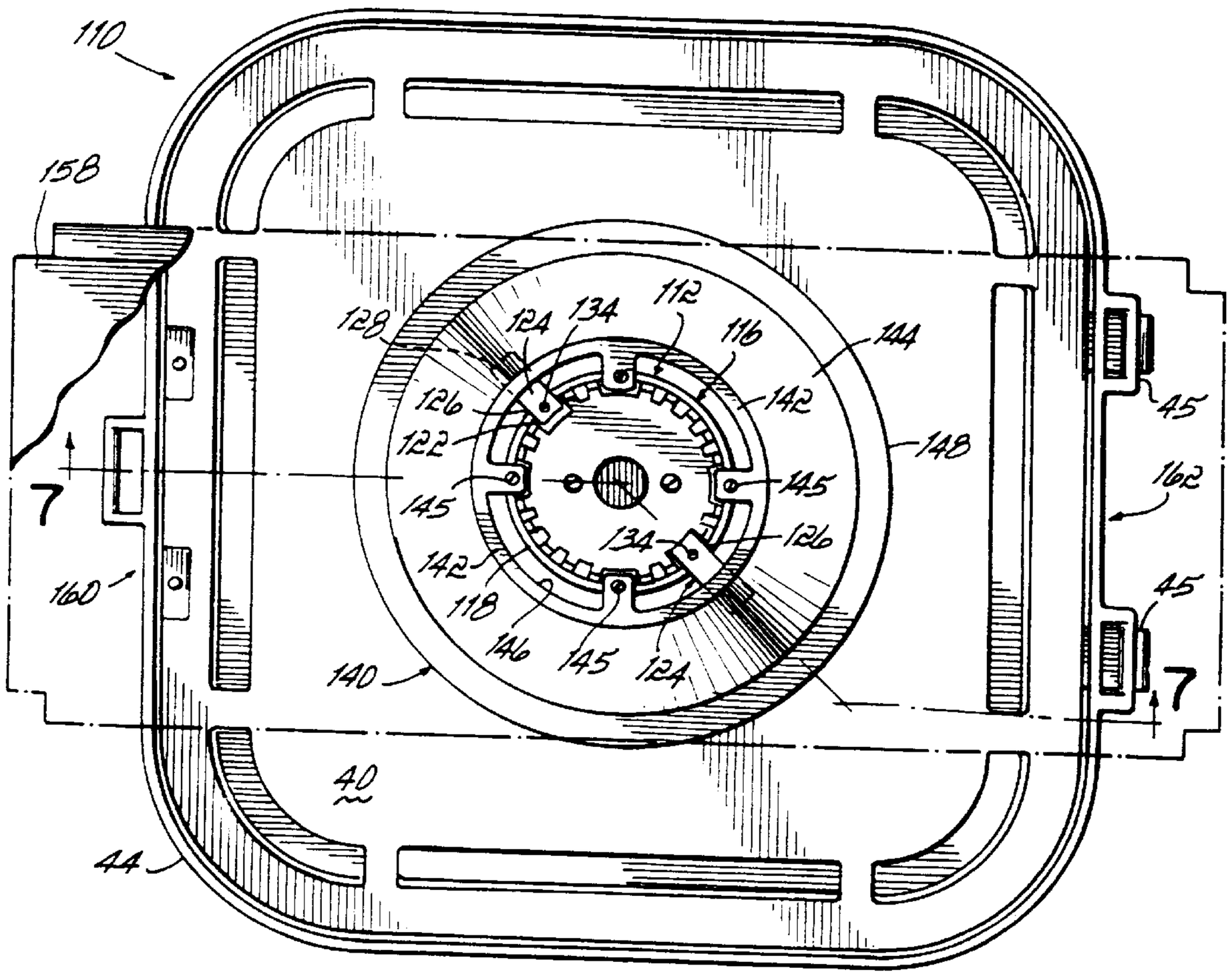
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FIG.6

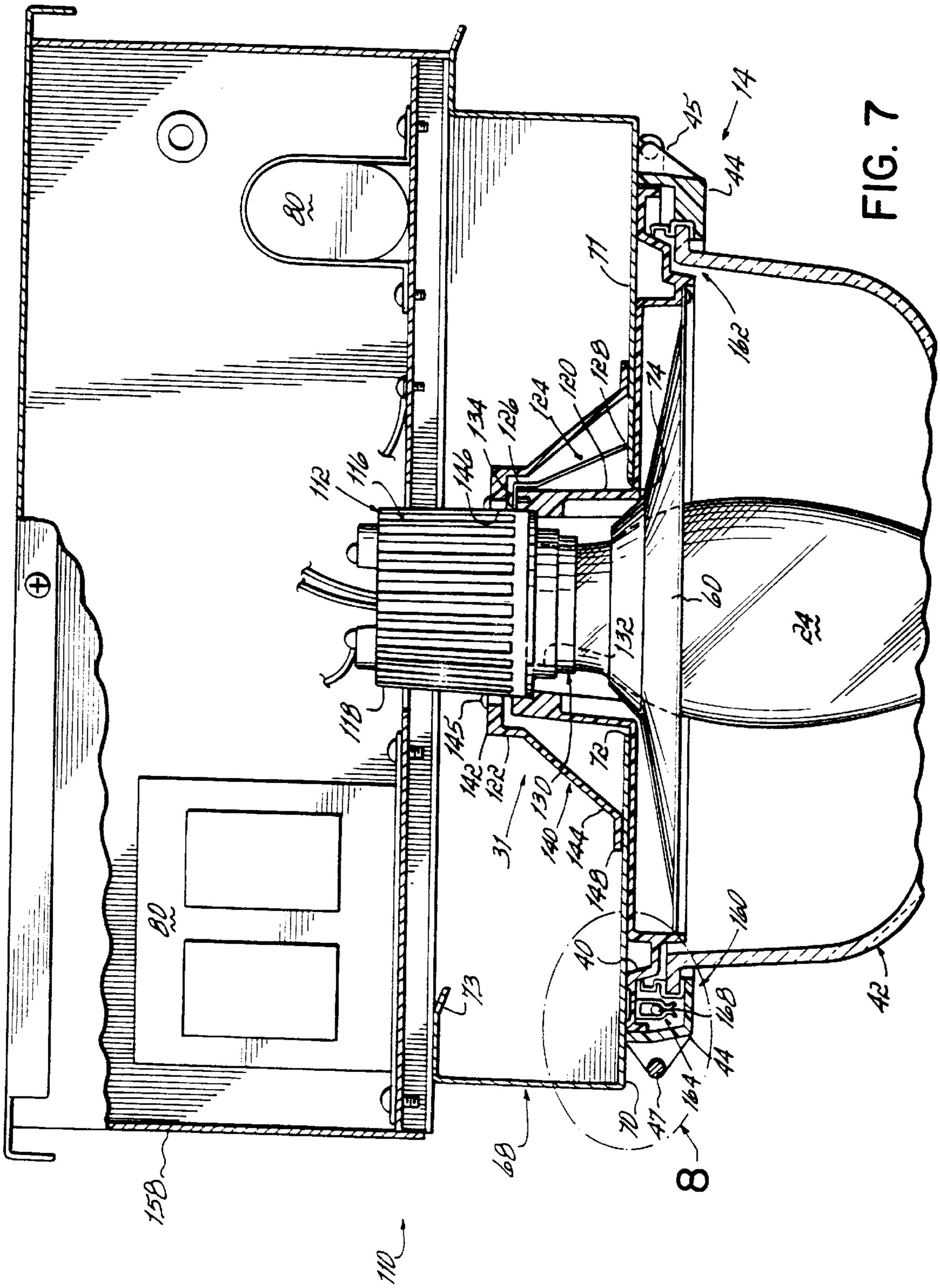
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FIG. 7

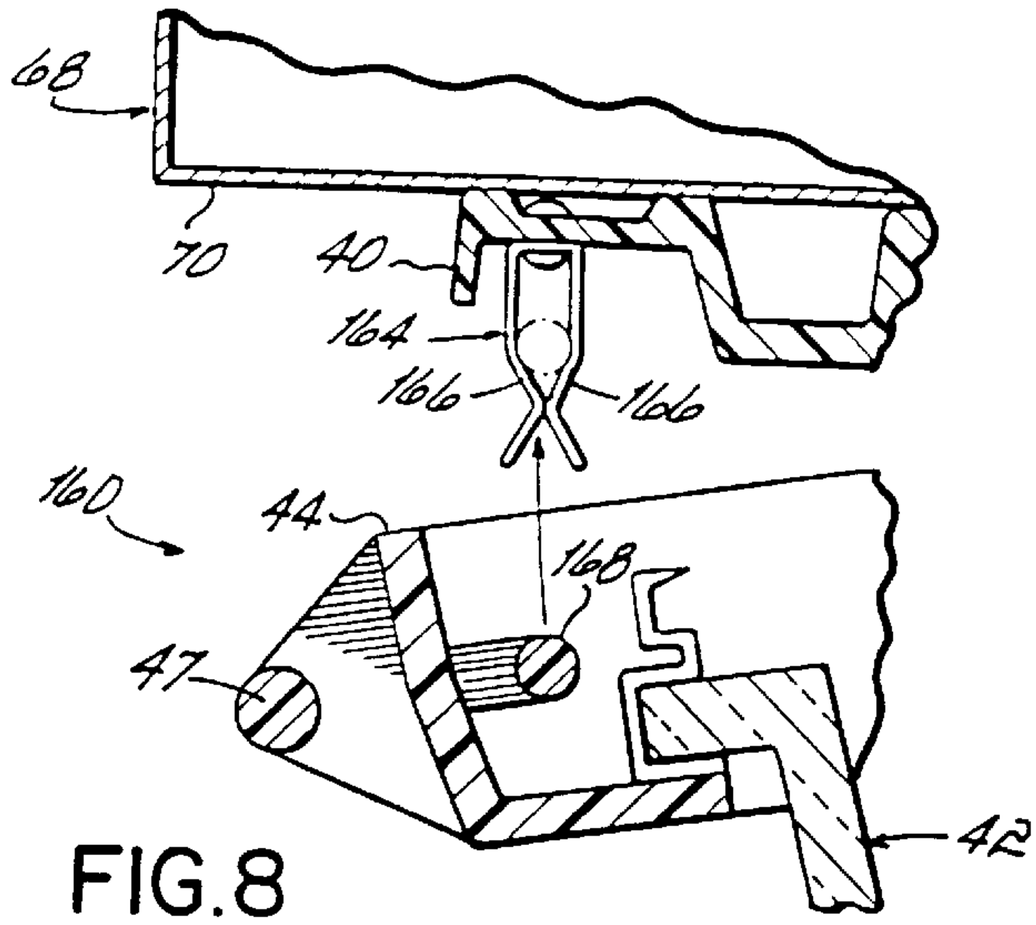


FIG.8

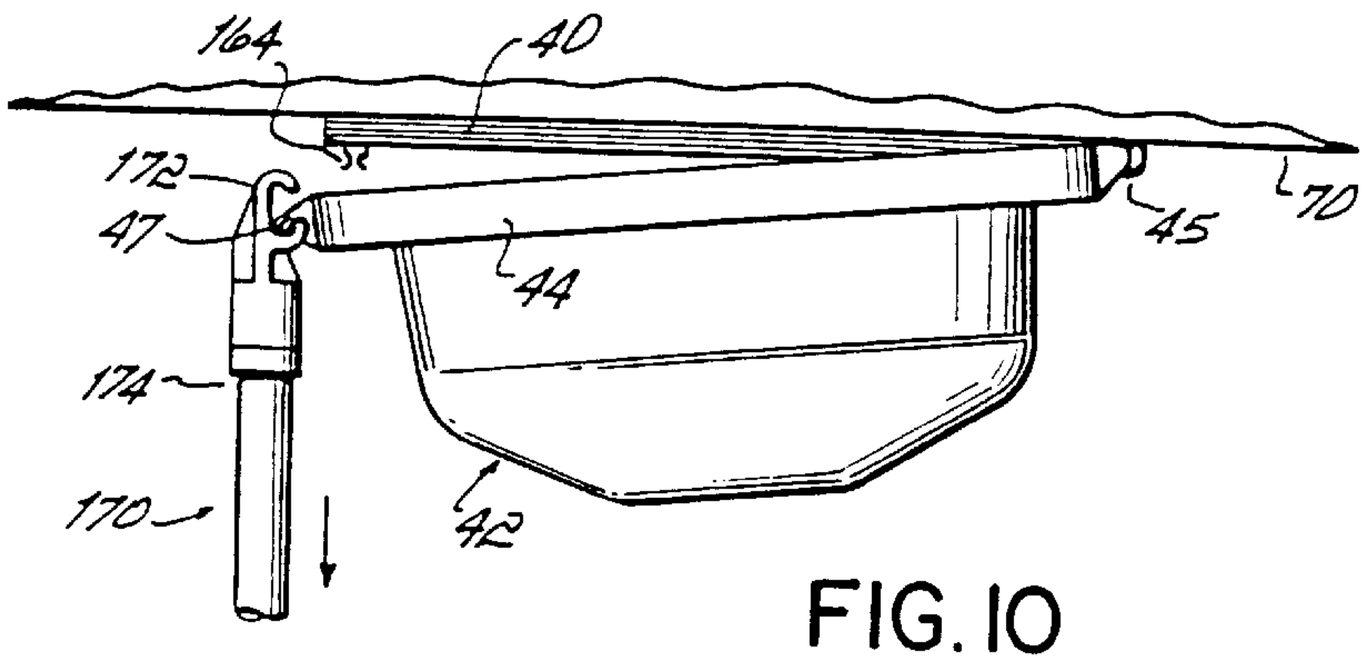
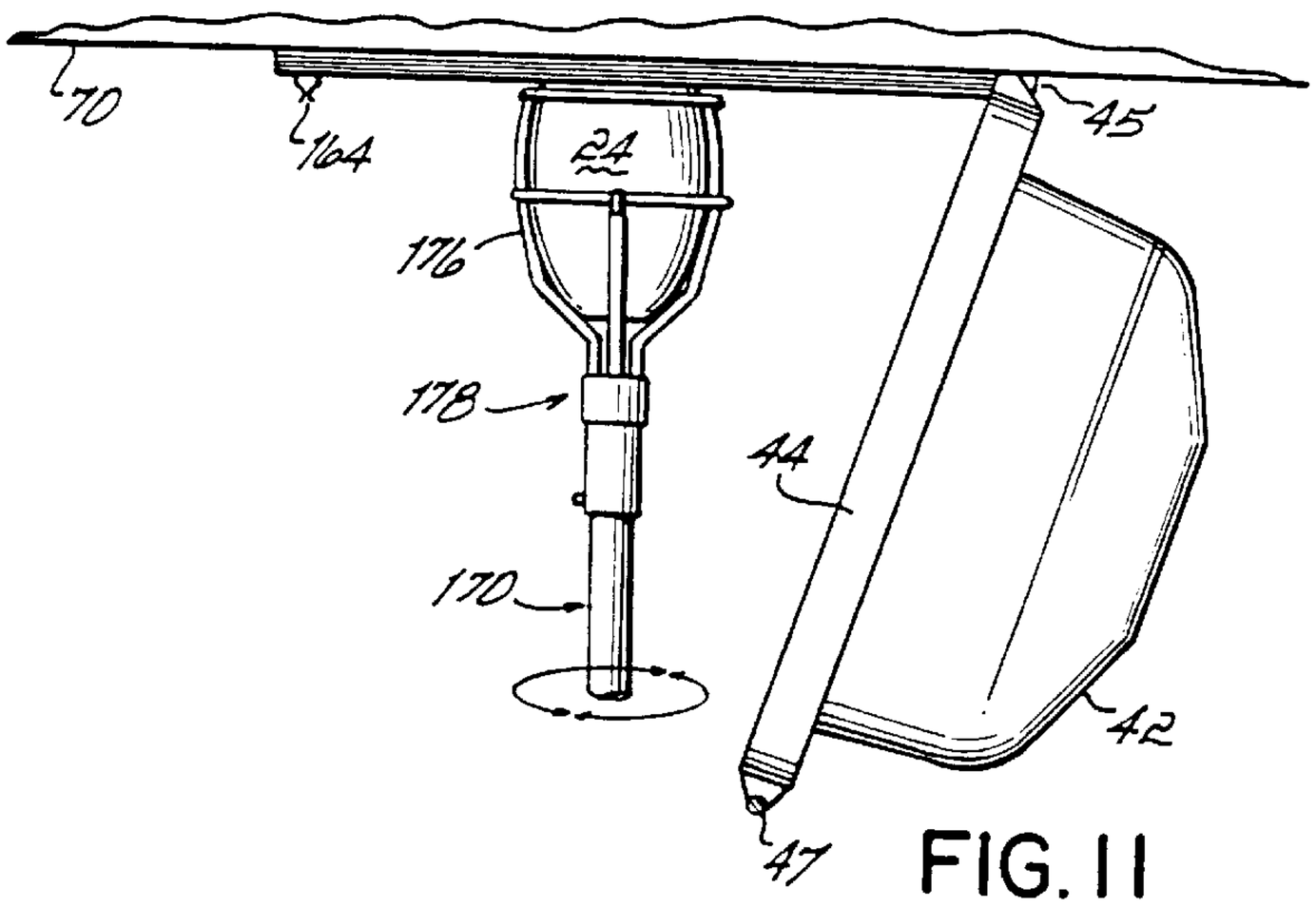


FIG. 10



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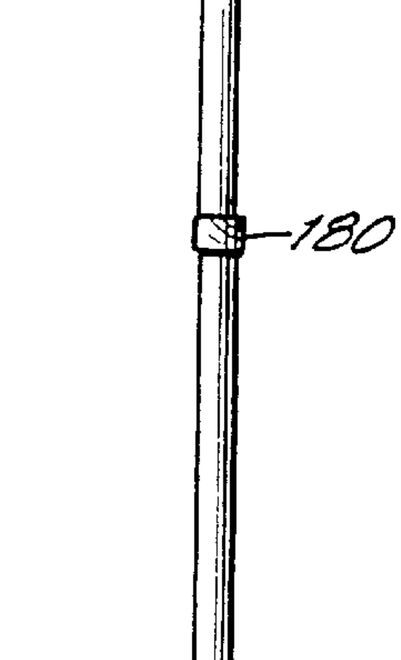

FIG. 9

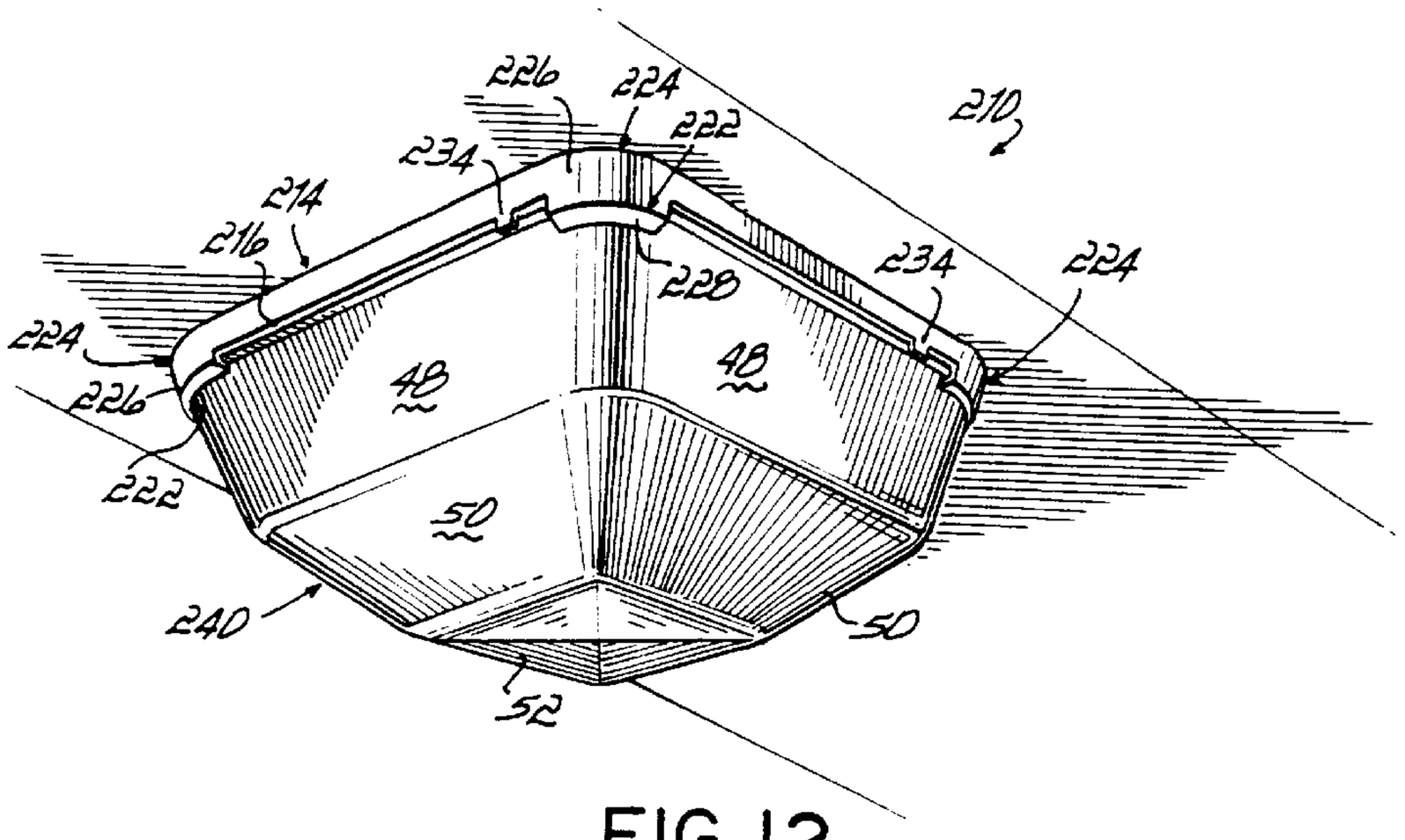
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FIG. 12

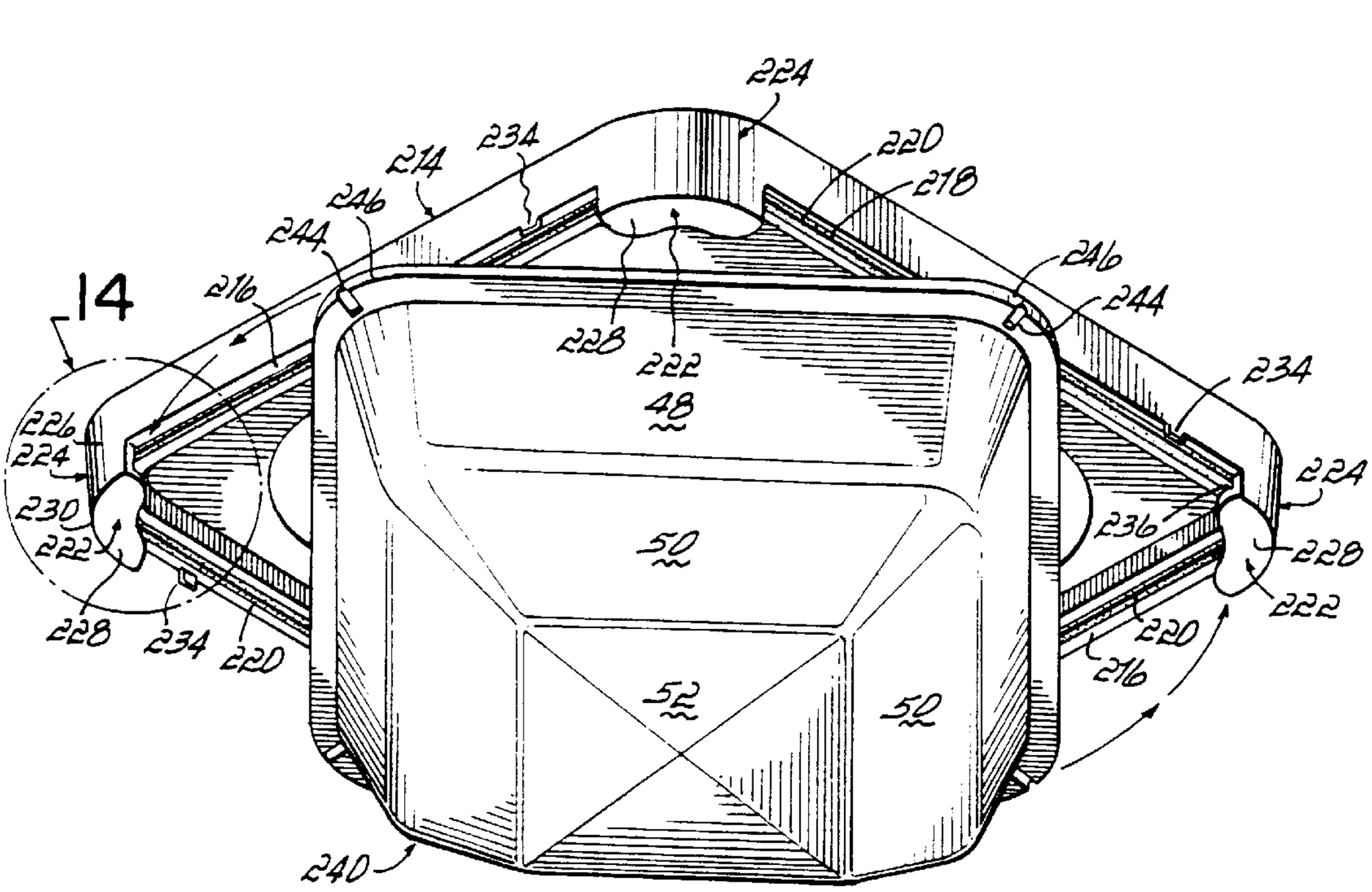
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FIG. 13

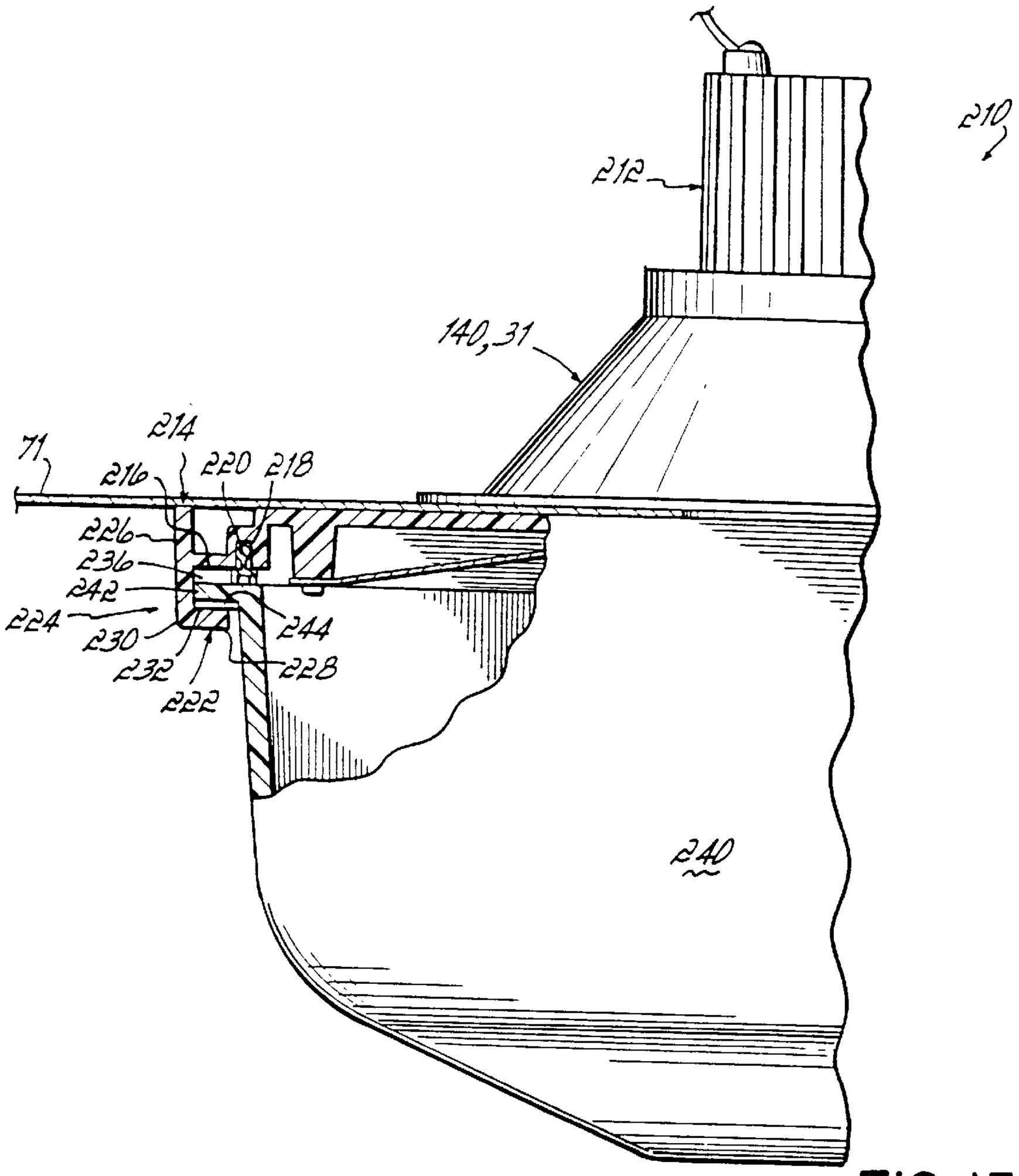
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FIG. 15

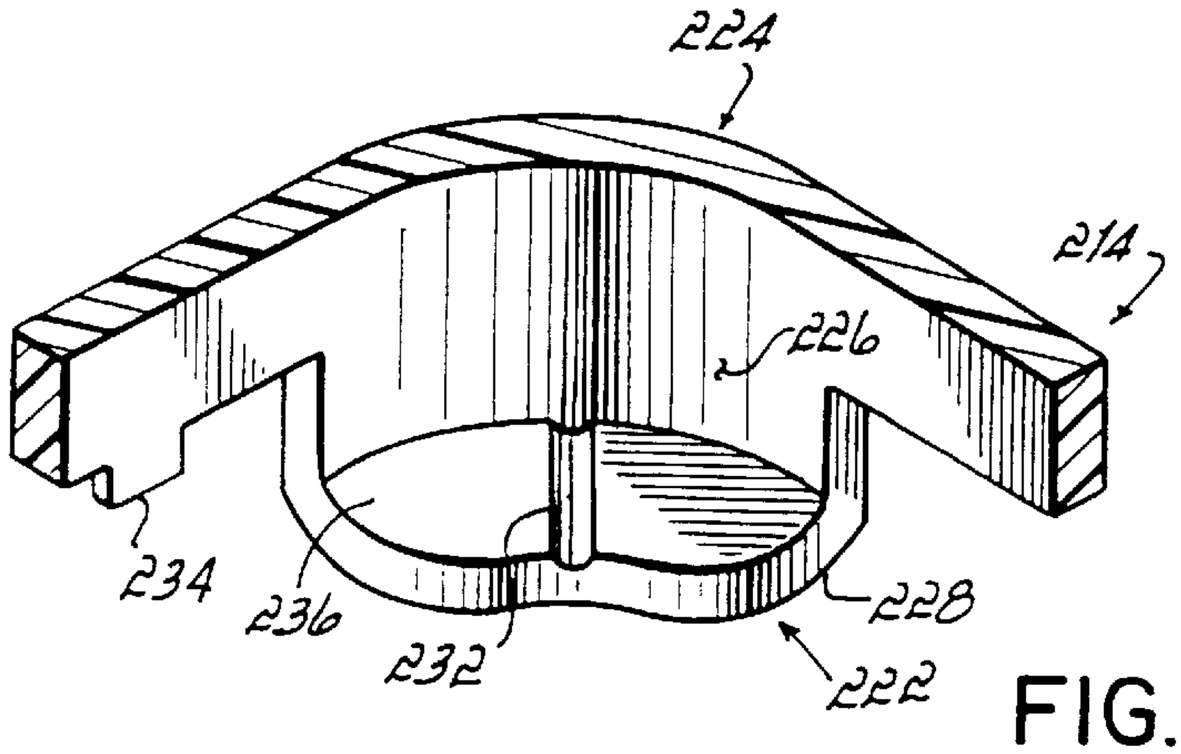
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FIG. 14

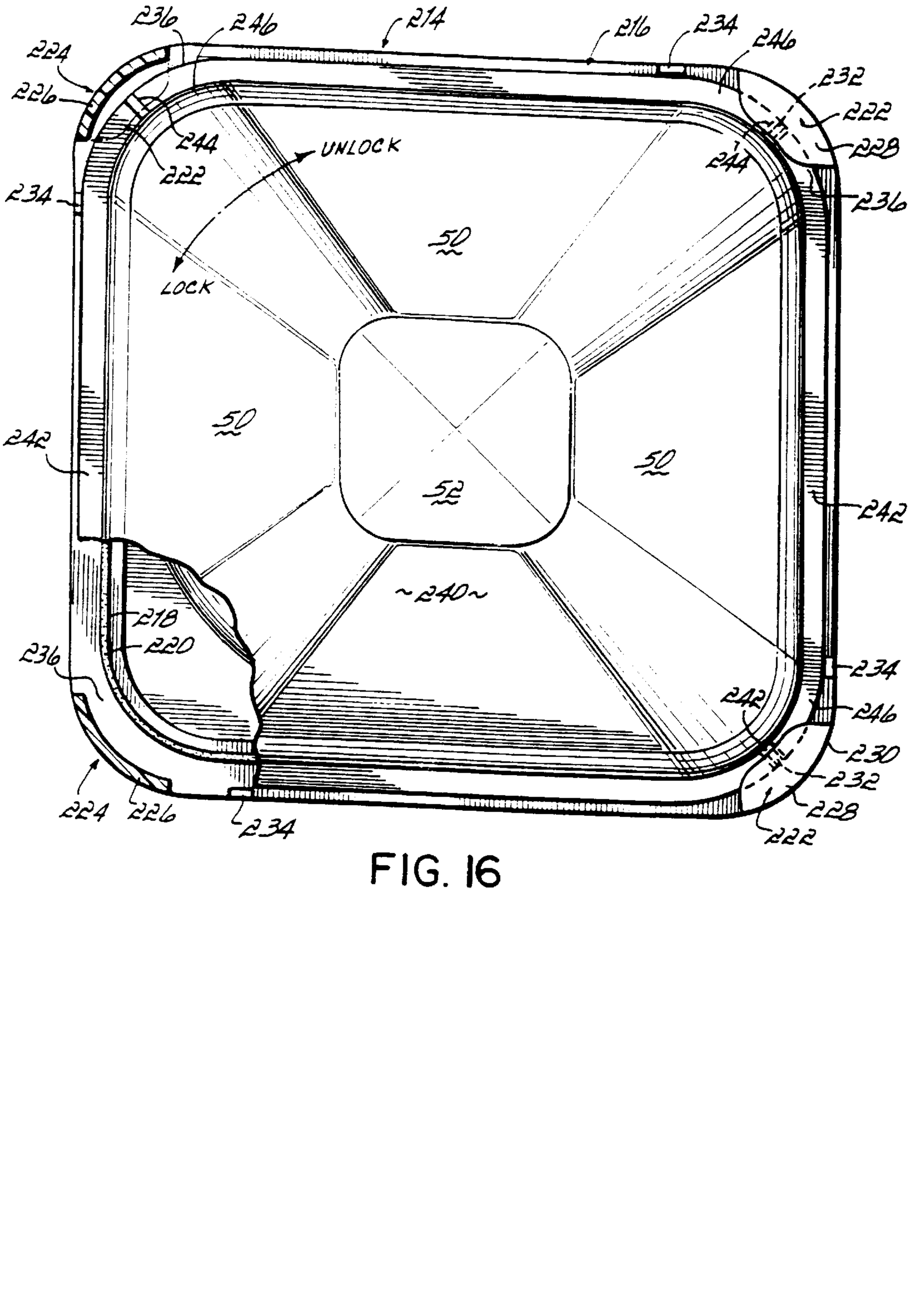
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FIG. 16

CANOPY LUMINAIRE

This is a continuation of application Ser. No. 08/532,901 filed Sep. 22, 1995 now U.S. Pat. No. 5,662,407.

FIELD OF THE INVENTION

This invention relates generally to canopy luminaires and more particularly to canopy luminaires adapted to be mounted to a horizontal mounting member by a single individual.

BACKGROUND OF THE INVENTION

Canopy luminaires are typically mounted on or in a flat horizontal member. They are used in many applications ranging from canopies over fuel pumps in a service station, to storefronts for convenience stores, to drive-throughs of restaurants. To provide the desired level of lighting, canopy luminaires typically use high intensity discharge (HID)) lamps.

HID light sources are regulated by control gear, which may include a ballast alone or in combination with other components such as capacitors, igniters, or other such equipment. This control gear may be as large as or larger than the lamp itself. Further, the lamp and control gear are frequently contained within a box-like housing, which must be mounted to the support structure.

To mount luminaires of currently existing designs, generally an opening must be made in the canopy in which the luminaire is to be mounted. As the canopy luminaire is in a box-like housing, an opening sized to receive that structure must be made. The luminaire is then mounted to the horizontal member of the support structure by brackets or other equipment, which typically requires a significant amount of manual labor. Further, cutting the substantial hole within the mounting member and installing the canopy luminaire into horizontal member typically requires the use of at least two electricians, resulting in a high installation cost.

Moreover, in luminaires of currently existing designs, the ballast is generally located within the housing with the other components of the luminaire. As a result, the operating temperature of the ballast and other control gear is increased due to exposure to heat from the ED lamp. This results in a corresponding reduction in the useful life of the components. Thus, the ballast and other control gear must be replaced on a more frequent basis than would otherwise be needed. As with installation, this too is an expensive procedure, as two individuals again are required, both of which generally must be electricians.

Another drawback associated with existing luminaires is that they frequently mount the HID lamp horizontally within the mounting structure. This degrades the amount of light emanating from the lamp, as approximately one-half of the luminous output of the lamp is directed upwardly, away from the target area. Although reflectors are used to reduce the amount of wasted light, a substantial portion of the luminous output of the lamp is nevertheless lost.

A still further drawback associated with existing luminaires is the difficulty in replacing the lamp. Typically, the glass lens of the luminaire is secured to the lamp housing by screws or similar fastening devices. To replace the lamp, an individual must use a ladder to reach the luminaire, loosen the fasteners to release the glass lens, and then replace the lamp. This is a time consuming procedure, often requiring more than one individual.

Thus, there is a substantial need for a canopy luminaire that may be easily and quickly mounted to a horizontal mounting member by a single individual. Further, there is a significant need for a canopy luminaire that mounts the lamp vertically to improve the lighting of the target area. Still further, there is a need for a canopy luminaire that extends the life of the ballast and other control gear and which permits quick and easy replacement of the lamp.

SUMMARY OF THE INVENTION

The present invention provides a canopy luminaire which overcomes drawbacks associated with the currently existing luminaires. More specifically, the canopy luminaire of the present invention comprises a luminaire housing having a bulbous body configured to receive the light-emitting section of a lamp and a narrow neck extending therefrom with an inner end connected to the bulbous body and an outer end, and a socket disposed within the narrow neck opening toward the bulbous body and which is sized to receive the base of a lamp. A spring clip for securement of the luminaire housing to a mounting structure having an opening into which the outer end of the narrow neck is inserted has an upper end secured to the narrow neck and a lower end extending downwardly and biased outwardly from the narrow neck. The narrow neck may be adapted to receive a locking component to fixedly secure the luminaire to a mounting member, wherein the mounting member opening is located between the locking component and the bulbous body.

The lower end of the spring clip is spaced above the bulbous body of the housing a distance sufficient to receive the mounting member therebetween. Preferably, there are two spring clips, which are secured on opposing sides of the narrow neck.

Preferably, the socket is oriented vertically and is sized to receive the base of a high intensity discharge lamp. Moreover, the luminaire may include a ballast that is external to the housing of the luminaire.

The locking component may comprise a threaded nut sized to receive the narrow neck therein and whose threads are sized to engage threads formed on the inner end of the narrow neck. The threads on the narrow neck comprise a plurality of threaded segments located circumferentially about the inner end of the narrow neck. The spring clip extends downwardly into the gap formed between two of the segments and the lower end of the spring clip is based outwardly beyond the outer surface of the threaded segments.

Alternatively, the locking component may comprise a clamp having an upper end adapted to be secured to the narrow neck, a lower end, and an opening therebetween sized to receive the narrow neck. The lower end of the clamp engages the mounting member to fixedly secure the luminaire thereto when the upper end of the clamp is secured to the narrow neck. Preferably the clamp is frustro-conical in shape, with the upper end having a diameter smaller than the lower end. Further, the lower end may include an outwardly extending annular flange for engaging the mounting member. The upper end of the clamp is secured to the narrow neck by a plurality of threaded fasteners.

Further to another aspect of the present invention, the canopy luminaire further comprises a spring clasp secured to the body of the luminaire housing at a first end and a glass lens hingedly attached to the body of the housing at a second end, opposite the first end, permitting the glass lens to swing between an open position and a closed position. The glass lens further includes a latch positioned for releasable engagement with the spring clasp and a handle secured to the glass lens to permit opening and closing of the lens.

In use, the single installer forms an opening in the horizontal mounting member that is sized to receive the narrow neck of the luminaire housing. The installer inserts the outer end of the narrow neck of the housing upwardly into the opening in the horizontal mounting member such that the periphery of the opening engages and deflects inwardly the spring clip. The installer continues to extend the neck upwardly through the opening until the spring clip emerges upwardly above the mounting member such that the spring clip is biased outwardly toward its original undeflected state. Thereafter, the installer may release the luminaire housing, which will be supported on the mounting member by the spring clip.

To permanently secure the luminaire to the mounting member, the installer may then go to the top of the mounting member and secure the locking component to the narrow neck, such as by securing the threaded collar onto the threads, or by securing the upper end of the clamp to the narrow neck, thereby engaging the lower end of the clamp with the mounting member.

To replace the lamp of the canopy luminaire, an individual uses a lamp changing pole having a generally C-shaped hook on a first end and a lamp gripper on a second, opposite end. The user engages the handle of the glass lens with the hook and moves the pole downwardly, releasing the latch from the spring clasp. The user may then swing the glass lens to the open position, supporting the handle in the hook. Upon reaching the open position, the user disengages the hook from the handle, inverts the pole, and engages the lamp with the lamp gripper. The lamp is removed from the base and the user inserts a second lamp, again using the lamp gripper. The pole is again inverted and the user engages the handle with the hook, swinging the glass lens to the closed position and releasably engaging the latch in the spring clasp.

Further to another aspect of the present invention, the bulbous body of the canopy luminaire may comprise a base having a periphery with a stop and a shelf extending from the periphery. The shelf includes a floor having a recess formed therein, the shelf and periphery forming a channel. The glass lens has a foot with a detent extending therefrom, the foot being sized to be slidably received in the channel to support the lens. The stop is adapted to engage the foot to limit the sliding movement of the foot in the channel and the detent operatively engages the recess to releasably hold the lens to the base. A gasket is secured in a peripheral groove formed along the periphery of the base and is intermediate the base and the foot of the glass lens. The gasket is deformed to permit the detent to be slidably received in the channel and urges the detent into the recess. Preferably, the foot is rotatably received in the channel. Further, the periphery of the base is a polygon (preferably square) with a shelf positioned at each corner.

In use, the glass lens is secured to the base by pressing the lens against and deflecting the gasket. The glass lens is then rotated in a first direction until the foot contacts the stops. The lens is then released and the detents operatively engage the recesses in the shelves. To remove the glass lens, the glass lens is pressed against the gasket, deforming same. The glass lens is rotated in a second direction until the foot is released from the shelf. The glass lens is then removed.

By virtue of the foregoing, there is thus provided a canopy luminaire that may be easily, quickly and reliably mounted to a horizontal mounting member by a single individual. Additionally, the luminaire mounts the high intensity discharge lamp vertically to more fully light the target area. The

luminaire also includes a ballast that may be positioned in an external location, to improve the useful life thereof by reducing the temperature to which the ballast is subjected. Still further, the luminaire is adapted to enable a single individual to quickly and easily replace the lamp.

These and other objects and advantages of the present invention shall become apparent from the accompanying drawings and the detailed description thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and, together with a general description of the invention given above, and the detailed description given below, serve to explain the principles of the invention.

FIG. **1** is a bottom perspective view of a canopy luminaire in accordance with the principles of the present invention;

FIG. **2** is a front view partially in cross-section of the canopy luminaire of FIG. **1** partially inserted into an opening in a horizontal mounting member;

FIG. **3** is a partial side view of the upper portion FIG. **2** of the canopy luminaire;

FIG. **4** is an illustrative view showing the canopy luminaire of FIG. **1** being inserted into a horizontal mounting member;

FIG. **5** is a view similar to FIG. **2**, but with the canopy luminaire installed in a horizontal mounting member;

FIG. **6** is a top view of another canopy luminaire in accordance with the principles of the present invention;

FIG. **7** is a section view along line **7**—**7** of FIG. **6**;

FIG. **8** is an enlarged view of the circled portion of the FIG. **7** with the latch released from the spring clasp;

FIG. **9** is an elevation view of a lamp changing pole in accordance with a further aspect of the present invention;

FIG. **10** is a schematic illustration view showing the opening/closing of the glass lens of FIG. **7**;

FIG. **11** is a schematic illustrative view showing removing/inserting a lamp for the canopy luminaire of FIG. **7**;

FIG. **12** is a bottom perspective view of another canopy luminaire in accordance with the principles of the present invention;

FIG. **13** is a bottom perspective view showing the glass lens of the canopy luminaire of FIG. **12** being rotatably secured to the base;

FIG. **14** is an enlarged top perspective view, broken away, of the circled portion of FIG. **13**;

FIG. **15** is a side view partially in cross-section of a corner of the canopy luminaire of FIG. **12**; and

FIG. **16** is a bottom view, partially broken away, of the canopy luminaire of FIG. **12**.

DETAILED DESCRIPTION OF THE DRAWINGS

With reference to FIGS. **1**–**3**, there is shown a canopy luminaire **10** comprising a housing **12** having a bulbous body **14** configured to receive the light-emitting section of a lamp and a generally cylindrical narrow neck **16** with an outer end **18** and an inner end **20** connected to bulbous body **14**. Disposed within outer end **18** of narrow neck **16** is a socket **21** sized to receive the base **22** of a lamp **24**, such as a high intensity discharge (HID) lamp as shown. A pair of spring clips **26** are secured at an upper end **28** to opposing

sides of outer end **18** of narrow neck **16** and extend downwardly adjacent inner end **20** and are biased outwardly therefrom to a lower end **30** for supporting luminaire housing **12** from a mounting member as will be described below. Further, luminaire **10** may include a locking component **31** for fixedly securing luminaire housing **12** to a mounting member. Specifically, located at inner end **20** of narrow neck **16**, and adjacent bulbous body **14**, are threads **32** adapted to receive a threaded nut **34**. (See FIGS. **4** and **5**.) Housing **12** is preferably manufactured from die cast aluminum which provides a light but strong construction, and which readily dissipates heat to prolong component life.

Bulbous body **14** comprises a base **40** extending outwardly from inner end **20** of narrow neck **16**. A prismatic glass lens **42** surrounded by frame **44** is hingedly secured to base **40** by hinges **45**, which permit glass lens **42** to swing between a closed position as shown and an open position (see FIG. **11**). A handle **47** is secured to frame **44** for opening and closing glass lens **42**. Base **40**, which is generally square, although any shape may be used, includes a centrally-positioned aperture **41** formed therein to permit passage of the base **22** of lamp **24** therethrough. Glass lens **42** has a plurality of sides **46**, each side having an upper panel **48** and a lower panel **50**. The lower ends of sides **46** are joined by a face **52** and the sides **46** are joined by corner sections **54**.

Located within bulbous body **14** may be an annular thermal stop **56** that is secured to base **40** near aperture **41** having an inner perimeter **58** sized to abut the outer surface of lamp **24**. Thermal stop **56** serves to reduce the amount of heat being transmitted from lamp **24** upwardly into narrow neck **16**. Also included within bulbous body **14** is a reflector **60**, such as a specular reflector, that is adapted to reflect incident light outwardly through glass lens **42**. Reflector **60** has an aperture **62** formed therein to permit passage of lamp **24** therethrough and has a round or square outer configuration to substantially cover base **40**. Preferably, reflector **60** is manufactured from specular aluminum. However, any reflective material may be used.

Luminaire housing **12** is generally adapted to be mounted to a horizontal mounting member, such as the canopy over fuel pumps in a service station. Moreover, socket **22** is preferably oriented vertically such that lamp **24** is suspended downwardly within luminaire housing **12**. This provides several advantages. First, lighting effectiveness depends upon the orientation of lamp **24**. Mounting of lamp **24** horizontally would result in approximately half of the emitted light from lamp **24** being projected upwardly and away from the target area. By contrast, vertical mounting of lamp **24** provides for uniform downward projection of light. Moreover, it has been found that vertical mounting results in a greater total luminous output.

Additionally, it is preferable to recess luminaire housing **12** within the mounting member both to improve the aesthetic appearance of the luminaire and to reduce the chances of physical damage thereto. The structure of luminaire housing **12** of the present invention provides for recessed mounting thereof by a single individual. Thus, unlike existing canopy luminaires requiring two or more individuals for installation, the canopy luminaire **10** of the present invention may be quickly and easily installed by a single individual.

More particularly, spring clips **26** are adapted to secure luminaire housing **12** to a mounting member, such as a horizontal mounting member **70** of a canopy **68**. To this end, spring clips **26**, which preferably have a rectangular cross-section, although any cross-sectional shape may be used, are formed from galvanized or stainless steel, tempered aluminum, plastic, or other material and have an upper end **28** secured to outer end **18** of narrow neck **16**. Although two spring clips **26** are shown, it will be readily appreciated that any number of spring clips may be used without departing from the spirit or scope of the present invention. Spring clips **26** extend downwardly along narrow neck **16** and adjacent inner end **20**, with the lower end **30** of spring clips **26** being biased outwardly therefrom such that lower end **30** extends outwardly of the outer surface of threads **32**. Moreover, lower end **30** of spring clips **26** are spaced above base **40** of bulbous body **14** a distance substantially equal to or slightly greater than the thickness of mounting member **70** for a purpose to be described below. Generally, the canopy mounting member **70** is manufactured in the form of U-shaped troughs **71** having a thickness ranging from about $\frac{1}{32}$ inch to about $\frac{1}{16}$ inch.

When luminaire housing **12** is to be mounted into horizontal mounting member **70** of a canopy **68**, and as best seen in FIGS. **4** and **5**, a generally circular aperture **72** is formed in horizontal mounting member **70** by a drill motor, hole saw, or any similar tool. Aperture **72** is sized to receive therethrough narrow neck **16** and threads **32**. As luminaire housing **12** is extended upwardly through aperture **72**, the periphery **74** of aperture **72** contacts lower end **30** of spring clips **26**, deflecting spring clips **26** inwardly. As spring clips **26** emerge through aperture **72**, they are biased outwardly toward their original undeflected shape such that lower end **30** of spring clips **26** extends outwardly over horizontal mounting member **70**. At this point, spring clips **26** are able to, at least temporarily, support luminaire housing **12** from horizontal mounting member **70**.

Luminaire housing **12** can then be permanently secured to horizontal mounting member **70** by threadably securing threaded nut **34** over threads **32**. Preferably threads **32** are integrally formed on inner end **20** of narrow neck **16**. However, as will be readily appreciated, threads **32** may be formed on a separate threaded sleeve that is secured to inner end **20**.

To prevent interference between spring clips **26** and threads **32**, threads **32** are preferably formed in four quadrants **76** spaced circumferentially about narrow neck **16**. Spring clips **26** extend downwardly between the gaps **78** formed between quadrants **76** and are biased outwardly such that lower end **30** protrudes outwardly from the outer surface of threads **32**. This permits threaded nut **34** to be secured to threads **32** without interference from spring clips **26**. Rather, as threaded nut **34** is secured to threads **32**, threaded nut **34** urges spring clips **26** inwardly into gaps **78** formed between quadrants **76**.

Still further, it may be preferable for the control gear **80** to be external to luminaire housing **12**. To this end, and as shown in FIG. **5**, control gear **80** may be secured to canopy **68** adjacent canopy luminaire **10**, but external therefrom and connected by any suitable electrical connectors **82**, such as a standard watertight fitting as shown. As shown in FIGS. **1–5**, outer end **18** of narrow neck **16** has been extended upwardly to accommodate electrical connectors **82**. However, as will be readily appreciated, the wiring compartment for the electrical connectors may be formed separately from housing **12**.

Typically, the control gear **80** would be mounted adjacent the edge of the mounting member trough **71**, as shown. Such a location removes control gear **80** from the lamp heat and permits control gear **80** to be surrounded by cool, ambient air. This location also provides for convenient access to

control gear **80** for maintenance. Still further, as shown in FIG. **7**, control gear **80** may be located in compartment **158**, which is in turn mounted on the tops **73** of adjoining U-shaped troughs **71** and fitted over, but not supported by or attached to, upper end **118** of luminaire housing **112**. Further, the components of control gear **80** could be dispersed to the periphery of compartment **158**, away from heat rising from luminaire **110**. By positioning control gear **80** external to, rather than inside, luminaire housing **12**, control gear **80** is subjected to lower heat variations and lower total temperature. As increased heat levels reduce the life of the control gear, external or remote mounting of control gear **80** from luminaire housing **12** increases the overall life of the components control gear **80**.

With reference to FIGS. **6** and **7**, there is shown another canopy luminaire **110** in accordance with the principles of the present invention similar to canopy luminaire **10** of FIGS. **1–5**, with like parts having like numbers. Canopy luminaire **110** comprises a housing **112** having a bulbous body **14** configured to receive the light-emitting section of a lamp and a generally cylindrical, stepped narrow neck **116** with an outer end **118** and inner end **120** connected to bulbous body **14**. The diameter of outer end **118** is less than that of inner end **120** such that there is a shelf **122** at the junction of outer end **118** and inner end **120**. A pair spring clips **124** having an upper end **126** and a lower end **128** are secured at upper end **126** to opposing sides of shelf **122** by screws **134**. Spring clips **124** extend downwardly and are biased outwardly from narrow neck **116** to lower end **128**, which is spaced above base **40** of bulbous body **14** a distance substantially equal to or slightly greater than the thickness of mounting member **70**. Spring clips **124** serve the same function as spring clips **26** in FIGS. **1–5**. As will be readily appreciated, although two spring clips **124** are shown, any number of spring clips may be used without departing from the spirit or scope of the present invention.

A thermal stop **130** having an inner perimeter **132** sized to abut the outer surface of lamp **24** may be located within inner end **120** of narrow neck **116**. As before, thermal stop **130** serves to reduce the amount of heat being transmitted by lamp **24** upwardly into narrow neck **116**. Although thermal stop **130** is shown located within inner end **120** of narrow neck **116**, it will be readily appreciated that thermal stop **130** may be located anywhere along the upper portion of lamp **24**.

Luminaire housing **112** is mounted to horizontal mounting member **70** of a canopy **68** by the same technique as described with respect to the first embodiment. Specifically, a circular aperture **72** is formed in horizontal mounting member **70**. Luminaire housing **112** is then extended upwardly through aperture **72**, and the periphery **74** of aperture **72** contacts lower end **128** of spring clips **124**, deflecting spring clips **124** inwardly. As spring clips **124** emerge through aperture **72**, they are biased outwardly toward their original undeflected shape such that lower end **128** of spring clips **124** extend outwardly over horizontal mounting member **70** and support luminaire housing **112** therefrom.

To fixedly secure luminaire housing **112** to horizontal mounting member **70**, locking component **31** comprises a clamp **140** having an upper end **142**, a lower end **144**, and an opening **146** therebetween sized to receive narrow neck **116** therein. Upper end **142** is adapted to be secured to shelf **122** of narrow neck **116**, such as by screws **145** or other threaded fastening devices. Lower end **144** is adapted to engage horizontal mounting member **70**, thereby securing luminaire housing **112** thereto. Preferably, clamp **140** has a frustro-conical configuration such that the diameter of upper end **142** is less than the diameter of lower end **144**. Moreover, lower end **144** may include an outwardly extending annular flange **148** to provide greater surface area contact with mounting member **70**. To secure luminaire housing **112** to mounting member **70**, clamp **140** is attached to luminaire housing **112** by inserting screws through upper end **142**, which presses lower end **144** downwardly onto mounting member **70**, thereby clamping mounting member **70** tightly between clamp **140** and bulbous body **14**. Although as shown clamp **140** is an integral component having a generally conical configuration, it will be readily appreciated that clamp **140** could be broken into several pieces, each of which has an upper end that is fixedly attached to shelf **122** and a lower end that engages mounting member **70**.

In use, to mount canopy luminaire **10**, **110**, a single individual may form aperture **72** in horizontal mounting member **70** by way of a drill motor, hole saw, or similar tool. After forming aperture **72**, outer end **18**, **118** of narrow neck **16**, **116** of luminaire housing **12**, **112** is inserted into aperture **72** and extended upwardly. As luminaire housing **12** is extended upwardly through aperture **72**, lower end **30**, **128** of spring clips **26**, **124** are deflected inwardly by periphery **74** of aperture **72**. Luminaire housing **12**, **112** is continued to be extended through aperture **72** until spring clips **26**, **124** emerge beyond horizontal mounting member **70**, enabling spring clips **26**, **124** to be biased outwardly toward their original undeflected shape. At this point, luminaire housing **12**, **112** may be supported from horizontal mounting member **70** by spring clips **26**, **124**.

The installer may then move to the top of canopy **68** where he may then place threaded nut **34** over luminaire housing **12** and threadably secure it over threads **32**. (FIGS. **4** and **5**). Alternatively, the installer then may place clamp **140** over luminaire housing **112** and secure upper end **142** of clamp **140** to shelf **122** of luminaire housing **112** by screws **145**. (FIG. **7**). By this method, luminaire housing **12**, **112** is fixedly secured to canopy **68**. Finally, the installer may then connect control gear **80** to luminaire housing **12** by any of the means described herein.

As will be readily appreciated by those skilled in the art, luminaire **10**, **110** may be constructed without spring clips **26**, **124** and still provide the other benefits of the present invention. In this embodiment, luminaire **10**, **110** is secured to horizontal mounting member **70** by attaching locking component **31** to luminaire housing **12**, **112**.

In accordance with a further aspect of the present invention, luminaire **10**, **110** is adapted to permit quick and easy replacement of lamp **24**. To this end, and referring to FIG. **7** and **8**, prismatic glass lens **42**, which is surrounded by frame **44**, is hingedly secured to base **40** by a pair of hinges **45**. This permits glass lens **42** to swing between a closed position, as shown in FIG. **7**, and an open position, as shown in FIG. **11**. Handle **47**, for opening and closing glass lens **42**, is secured to frame **44** at a first end **160** of base **40** of bulbous body **14**. Hinges **45** are secured to the outside of frame **44** at a second, opposite end **162** of base **40** of bulbous body **14**.

To releasably secure glass lens **42** in the closed position, a spring clasp **164** is secured at first end **160** of base **40**. Spring clasp **164** comprises a pair of opposed, flexible fingers **166**. A latch **168** is secured on the inside of frame **44**, and is positioned to releasably engage spring clasp **164**.

With reference to FIG. **9**, to enable an individual to replace lamp **124** without the necessity of a ladder or other

tools, lamp changing pole **170** is provided having a generally C-shaped hook **172** on a first end **174**. A lamp gripper **176** is secured to the second end **178** of pole **170**, the lamp gripper having a construction that is well known in the ark Moreover, pole **170** is of a length sufficient to enable the individual to reach luminaire **10**, **110** from the ground, without the need for a ladder. Although C-shaped hook **172** and lamp gripper **176** are described as being attached to opposite ends of pole **170**, it will be readily apparent that C-shaped hook **172** and lamp gripper **176** may be placed on separate poles without departing from the spirit or scope of the present invention.

C-shaped hook **172** is adapted to engage handle **47** for opening and closing of glass lens **42** as best seen in FIG. **10**. Further, to electrically isolate the individual from any potential electric discharge from luminaire **10**, **110**, pole **170** includes a wooden segment **180**, or other insulator, at the mid-point thereof.

In use, to replace a lamp, the individual engages handle **47** with hook **172**. By moving pole **170** downwardly, latch **168** is disengaged from spring clasp **164**. Hook **172** then supports handle **47** while glass lens **42** is being swung to the open position. (FIG. **10**). Hook **172** is then disengaged from handle **47** and pole **170** is inverted. As illustrated in FIG. **11**, the individual then engages lamp **24** with lamp gripper **176** and removes lamp **24**. A second lamp is then inserted into lamp gripper **176**, and this lamp is then inserted into luminaire **10**, **110**. Lamp gripper **176** is then disengaged from new lamp **24**, pole **170** is inverted, and hook **172** is engaged with handle **47**. Again, handle **47** is supported in hook **172** while glass lens **42** is swung to the closed position and latch **168** is releasably engaged with spring clasp **164**.

Finally, with reference to FIGS. **12–16**, there is shown a still further canopy luminaire **210** in accordance with the principles of the present invention similar to canopy luminaire **110** of FIGS. **6–8**, with like parts having like numbers. Canopy luminaire **210** comprises a luminaire housing **212** having a polygonal, and preferably square, base **214** with a periphery **216**. Although base **214** is preferably square, as will be readily appreciated by those skilled in the art, any shape base may be used. A peripheral groove **218** is formed in periphery **216** and a gasket **220** is secured within peripheral groove **218** for a purpose to be described below.

A shelf **222** is formed in each of the corners **224** of periphery **216**. Shelf **222** comprises a wall **226** extending downwardly from periphery **216** and a floor **228** extending inwardly from the lower end **230** of wall **226**. Formed within floor **228** are recesses **232**. Also extending downwardly from periphery **216** are stops **234** that are positioned counterclockwise from and near each shelf **222**. Together, periphery **216**, wall **224**, and floor **228** form channels **236**.

Glass lens **240**, which is generally square, includes an outwardly extending foot **242** having a detent **244** extending downwardly from each of the comers **246** of foot **242**. Foot **242** is adapted to engage gasket **220**, which is intermediate foot **242** and periphery **216** of base **214**. Still further, foot **242** has a thickness that is sized to be slidably received within channels **236** to support glass lens **240** in shelves **222**. Moreover, detent **244**, which extends downwardly from foot **242**, is adapted to operatively engage recess **232** in shelf **222** to releasably hold glass lens **240** to base **214**.

In use, to secure glass lens **240** to base **214**, glass lens **240** is pressed upwardly against gasket **220**, such that foot **242** engages same. Gasket **220** is then deformed and glass lens **240** is rotated counterclockwise or a first direction until corners **246** and detents **244** are rotatably, slidably received in channels **236**. Rotation of glass lens **240** is continued until foot **242** contacts stops **234**, which prevents over rotation of glass lens **240**. At this point, glass lens **240** is appropriately in line with base **214**. Glass lens **240** is then released, gasket **220** urges glass lens **240** downwardly, and detent **244** operatively engages recesses **232** to releasably hold glass lens **240** to base **214**. To remove glass lens **240**, glass lens **240** is again pushed upwardly such that foot **242** compresses or deforms gasket **220**. Glass lens **240** is then rotated clockwise or a second direction, releasing comers **246** from shelves **222**. Glass lens **240** may then be lowered from base **214**. As will be readily appreciated by those skilled in the art, canopy luminaire **210** may be adapted such that glass lens **240** is secured to base **214** by clockwise rotation and released from base **214** by counterclockwise rotation without departing from the spirit or scope of the present invention.

By virtue of the foregoing, there is thus provided a canopy luminaire that may be easily and quickly mounted into a horizontal mounting member by a single individual. Further, the canopy luminaire of the present invention includes a vertically oriented lamp to improve lighting of the target area. Still further, the canopy luminaire of the present invention includes control gear external to the luminaire housing, which extends the life of the components of the control gear, including the ballast. Finally, the canopy luminaire of the present invention permits an individual to quickly and easily replace a lamp.

While the present invention has been illustrated by description of a several embodiments which have been described in considerable detail, it is not the intention of the applicant to restrict or in any way limit the scope of the appended claims to such detail. Additional advantages will readily appear to those skilled in the art. Thus, the invention in its broadest aspects is not limited to the specific details, representative apparatus and method, and illustrative examples shown and described. Accordingly, departures may be made from the details without departing from the spirit or scope of applicant's general inventive concept.

What is claimed is:

1. A light fixture adapted for installation by a single individual into a generally horizontal mounting member having an opening therein, comprising:

a housing configured to receive a lamp having an electrical contact;

a temporary retainer attached to said housing for securement of said light fixture to the mounting member when said temporary retainer is inserted upwardly through the opening in the mounting member; and

electrical control gear for mounting above said mounting member, said electrical contact of said lamp being electrically connectable to said electrical control gear.

2. The light fixture of claim **1** further comprising a locking component securable to said housing from above the mounting member, when the temporary retainer is inserted through the opening in the mounting member, to fixedly securement said light fixture to said mounting member.

3. The light fixture of claim **1** wherein said temporary retainer includes a spring clip biased outwardly from said housing to a securement position for securement of said light fixture to the mounting member when said spring clip is inserted upwardly through the opening in the mounting member.

4. The light fixture of claim **1** wherein said housing includes a lower end, said light fixture further comprising:

a lens movably secured to said lower end of said housing, said lens being selectively movable between a first locked position and a second open position.

5. The light fixture of claim 4 wherein said lower end of said housing includes a base with a periphery having a stop extending therefrom, said light fixture further comprising:

a shelf having a wall extending from said periphery of said base and a floor having a recess formed therein, said shelf and said periphery of said base forming a channel; and

a foot on said lens, said foot including a detent extending therefrom and being sized to be slidably received in said channel to support said lens in said shelf, said foot engaging said stop to limit the sliding movement of said foot in said channel and said detent operatively engaging said recess in said floor to releasably hold said lens to said base whereby said lens may be selectively moved between said first locked position and said second open position.

6. The light fixture of claim 5 further comprising:

a peripheral groove formed in said periphery of said base; and

a gasket secured to said peripheral groove, said gasket intermediate said foot and said periphery, whereby said gasket is deformed to permit said detent on said foot to be slidably received in said channel and urges said detent into said recess to releasably hold said lens to said base.

7. A canopy luminaire adapted for installation by a single individual into a mounting member having an opening therein, comprising:

a luminaire housing having a lower section configured to receive the light emitting section of a lamp and an upper section extending therefrom with an inner end interconnected to said lower section and with all outer end;

a temporary retainer attached to said housing for securement of said luminaire housing adjacent to the mounting member when said temporary retainer is inserted upwardly through the opening in the mounting member; and

a locking component securable to said housing from above, when said temporary retainer has been inserted upwardly through the opening in the mounting member, to fixedly secure said light fixture to said mounting member.

8. The canopy luminaire of claim 7 further comprising a vertically oriented socket disposed within said upper section having an opening for receiving the base of a lamp.

9. The canopy luminaire of claim 8 further comprising an electrical connection attached to said socket and insertable through the opening in the mounting member for electrically connecting said socket and an electrical source located above the opening in the mounting member to energize a lamp whose base is received in said socket.

10. The canopy luminaire of claim 8 further comprising control gear locatable above the mounting member and an electrical connection between said socket and said control gear.

11. The canopy luminaire of claim 7 wherein said temporary retainer includes a spring clip biased outwardly from said housing to a securement position for securement of said light fixture to the mounting member when said spring clip is inserted upwardly through the opening in the mounting member.

12. The canopy luminaire of claim 7 further comprising:

a lens movably secured to said lower section of said luminaire housing, said lens being selectively movable between a first locked position and a second open position.

13. The light fixture of claim 12 wherein said lower section of said luminaire housing includes a base with a periphery having a stop extending therefrom, said canopy luminaire further comprising:

a shelf having a wall extending from said periphery of said base and a floor having a recess formed therein, said shelf and said periphery of said base forming a channel; and

a foot on said lens, said foot including a detent extending therefrom and being sized to be slidably received in said channel to support said lens in said shelf, said foot engaging said stop to limit the sliding movement of said foot in said channel and said detent operatively engaging said recess in said floor to releasably hold said lens to said base whereby said lens may be selectively moved between said first locked position and said second open position.

14. The light fixture of claim 13 further comprising:

a peripheral groove formed in said periphery of said base; and

a gasket secured to said peripheral groove, said gasket intermediate said foot and said periphery, whereby said gasket is deformed to permit said detent on said foot to be slidably received in said channel and urges said detent into said recess to releasably hold said lens to said base.

15. The canopy luminaire of claim 13 wherein said foot is rotatably, slidably received in said channel.

16. The canopy luminaire of claim 15 wherein said periphery is a polygon and a shelf is positioned at each of the comers of said polygon.

17. The canopy luminaire of claim 16 wherein said periphery is square in shape.

18. A method of installing a light fixture having a housing, a temporary retainer attached to said housing, a lamp socket, electrical control gear and electrical wiring, comprising:

inserting the temporary retainer through a mounting panel with the temporary retainer inserted from below the mounting panel upwardly into an opening in the mounting panel;

locating the electrical control gear above the mounting panel:

engaging the mounting panel with the temporary retainer to support the housing from the mounting panel by the temporary retainer;

coupling the electrical wiring between the lamp socket and the electrical control gear.

19. The method of claim 18 further comprising the step of fixedly securing the housing to the mounting panel from above the mounting panel after the engaging and supporting step.

20. The method claim of 18 wherein the temporary retainer includes a spring clip biased outwardly from the housing to a securement position, and wherein said inserting step includes tie steps of:

inserting the spring clip upwardly into the opening in the mounting panel, with the periphery of the opening engaging and deflecting inwardly the spring clip; and

inserting the spring clip further upwardly trough the opening until the spring clip emerges above and beyond the mounting member such that the spring clip is biased outwardly toward its securement position to support the housing below the mounting panel.

21. A canopy luminaire mountable on a generally horizontal panel of a canopy having an opening formed therein, said luminaire comprising:

an upper section including a bottom with an opening therein alignable with said canopy opening when said canopy luminaire is mounted on said generally horizontal panel with said upper section located above said panel;

a lower section including a lens mount having a lens operatively secured thereto, said lower section being located below said generally horizontal panel when said canopy luminaire is mounted on said generally horizontal panel;

a vertically oriented socket for receiving the base of a lamp, at least a portion of said socket located above said generally horizontal panel with said socket aligned with said openings in said canopy panel and said bottom of said upper section when said canopy luminaire is mounted on said generally horizontal panel with said upper section located above said canopy panel; and

a vertically oriented lamp suspended downwardly in said vertically oriented socket and extending through said opening in said generally horizontal panel, wherein the base of said lamp is engaged in said socket when said canopy luminaire is mounted thereto and substantially all of the light emitting portion of said lamp is located below said opening in said generally horizontal panel when said canopy luminaire is mounted thereto.

22. The canopy luminaire of claim **21**, wherein said lens mount of said lower section has a perimeter substantially larger than the perimeter of said opening in said generally horizontal panel.

23. The canopy luminaire of claim **22** wherein said lens mount is generally rectangular and said opening in said canopy panel is generally circular and has a diameter substantially smaller than the diagonal dimension of said rectangular lens mount.

24. The canopy luminaire of claim **22**, wherein said opening in said bottom of said upper section and said opening in said generally horizontal panel are each substantially circular and centered upon the axis of said socket and lamp.

25. The canopy luminaire of claim **22** wherein said lens has a vertical dimension substantially coextensive with the vertical dimension of the light emitting portion of said lamp.

26. The canopy luminaire of claim **25** wherein said upper section further includes:

control gear electrically connected to said socket when said luminaire is mounted on said canopy panel; and

a compartment in which is located said control gear, said compartment being spaced above said generally horizontal panel of said canopy to reduce the transmission of heat from said lamp to said control gear.

27. The canopy luminaire of claim **21** wherein said lens has a vertical dimension substantially coextensive with the vertical dimension of the light emitting portion of said lamp.

28. The canopy luminaire of claim **27** wherein said upper section further includes:

control gear electrically connected to said socket when said luminaire is mounted on said canopy panel; and

a compartment in which is located said control gear, said compartment being spaced above said generally horizontal panel of said canopy to reduce the transmission of heat from said lamp to said control gear.

29. The canopy luminaire of claim **28** further comprising:

an extension projecting upwardly from said lens mount and through said opening in said generally horizontal panel; and

a locking component located above said generally horizontal panel engageable with said extension to secure said lens mount of said lower portion adjacent and below said generally horizontal panel.

30. The canopy luminaire of claim **21** wherein said upper section further includes:

control gear electrically connected to said socket when said luminaire is mounted on said canopy panel; and

a compartment in which said control gear is located, said compartment being spaced above said generally horizontal panel of said canopy to reduce the transmission of heat from said lamp to said control gear.

31. The canopy luminaire of claim **21**, further comprising:

an extension projecting upwardly from said lens mount and through said opening in said generally horizontal panel; and

a locking component located above said generally horizontal panel engageable with said extension to secure said lens mount of said lower portion adjacent and below said generally horizontal panel.

32. The canopy luminaire of claim **31** wherein said lens has a vertical dimension substantially coextensive with the vertical dimension of the light emitting portion of said lamp.

33. The canopy luminaire of claim **21**, wherein the socket is located entirely above said lens mount.

34. The canopy luminaire of claim **21**, wherein the lens mount and the lens are dimensioned such that the lens mount and lens cannot pass through the canopy opening.

35. The canopy luminaire of claim **34**, wherein the canopy opening defines a first major horizontal dimension and the lens includes an upper edge defining a second major horizontal dimension and the first major horizontal dimension is less than the second major horizontal dimension.

36. The canopy luminaire of claim **34**, wherein the canopy opening defines a first horizontal area and the lens includes an upper edge defining a second horizontal area and the first horizontal area is less than the second horizontal area.

37. The canopy luminaire of claim **21**, wherein said lamp is a high intensity discharge lamp.

38. A canopy luminaire mountable on a generally horizontal panel of a canopy having an opening formed therein, said luminaire comprising:

a lower section including a lens mount having a generally planar upper surface positionable adjacent the lower surface of said generally horizontal panel;

a lamp extendable through said opening in said canopy panel, said lamp having a base located at least partially above said canopy panel and a light emitting portion located below said canopy panel,

a lens secured to said lens mount and enclosing the light emitting portion of said lamp;

an extension projecting upwardly from said lens mount and extendable through said opening in said canopy panel; and

a locking component located above said generally horizontal panel engageable with said extension to secure said lens mount of said lower section adjacent said generally horizontal panel.

39. The canopy luminaire of claim **38** further comprising:

an upper section located above said canopy panel when said canopy luminaire is mounted thereto;

a socket for receiving the base of said lamp, said socket being vertically oriented and located at least partially above the canopy panel and aligned with the opening therein when said luminaire is mounted to said canopy

to vertically suspend said lamp downwardly from said vertically oriented socket and aligned with said canopy panel opening wherein the base of said lamp aligned with said canopy panel opening in said socket and substantially all of the light emitting portion of said lamp is located below said canopy panel opening and enclosed by said lens when said luminaire is mounted on said canopy panel.

40. The canopy luminaire of claim **39** wherein said upper section further includes control gear electrically connected to said socket when said luminaire is mounted to said canopy panel, said control gear being located in a compartment of said upper section which is spaced above said canopy panel to reduce the transmission of heat from said lamp to said control gear.

41. A canopy luminaire mountable on a generally horizontal panel of a canopy having an opening formed therein, said canopy luminaire comprising:

an upper housing having a compartment spaced above said horizontal panel when said canopy luminaire is mounted thereto;

a vertically oriented socket for receiving the base of a lamp, said vertically oriented socket being located at least partially above said generally horizontal canopy panel when said canopy luminaire is mounted thereto;

a lens mount having a lens operatively secured thereto, said lens mount being located below said generally horizontal canopy panel when said canopy luminaire is mounted thereto;

a vertically oriented lamp suspended downwardly in said vertically oriented socket and aligned with said opening in said generally horizontal canopy panel, said lamp having a base aligned with said opening in said generally horizontal canopy panel when said canopy luminaire is mounted to said generally horizontal canopy panel and substantially all of the light emitting portion of said lamp is located below said opening in said generally horizontal canopy panel when said canopy luminaire is mounted thereto; and

electrical control gear connected to said socket when said luminaire is mounted to said generally horizontal canopy panel, said control gear being located in compartment spaced above said generally horizontal canopy panel to reduce the transmission of heat from said lamp to said control gear.

42. The canopy luminaire of claim **41**, wherein said lens mount has a perimeter and said opening in said generally horizontal panel has a substantially circular periphery which is substantially smaller than the perimeter of said lens mount.

43. The canopy luminaire of claim **41**, said compartment having a substantially circular opening formed in the lower surface thereof, wherein said substantially circular opening in said compartment, said substantially circular opening in said generally horizontal canopy panel, and said vertically oriented socket have a common axis.

44. A method of installing a canopy luminaire to a generally horizontal panel of a canopy, said canopy luminaire having an upper section including electrical control gear, a lower section including a lens mount having a lens operatively secured thereto, said lens mount having a periphery and an opening therein, and a vertically oriented socket for receiving the base of a lamp, the method comprising:

forming a substantially circular opening in said generally horizontal panel, said opening having a perimeter being substantially smaller than said perimeter of said lens mount;

positioning said upper and lower section above and below said generally circular opening, respectively, with said vertically oriented socket located at least partially above said substantially circular opening and aligned therewith; and

inserting the base of a lamp into said vertically oriented socket, wherein the base of said lamp is aligned with said generally circular opening and substantially all of the light emitting portion of said lamp is located below said generally circular opening.

45. The method of installing a canopy luminaire of claim **44** farther comprising securing the lower section to the generally horizontal panel with a locking component located above said generally horizontal panel with said generally horizontal panel sandwiched between the upper and lower sections.

46. The method of installing a canopy luminaire claim **45**, said lens mount further including a vertically oriented member having a lower end connected to said lens mount and an upper end extending above said lens mount, wherein said securing step includes inserting said upper end of said vertically oriented member upwardly through said generally horizontal panel opening and securing said locking component and said vertically oriented member at a point above said generally horizontal panel.

47. The method of installing a canopy luminaire of claim **44** wherein said step of forming a substantially circular opening in said generally horizontal panel comprises drilling said substantially circular opening into said generally horizontal panel with a hole saw.

48. The method of installing a canopy luminaire of claim **44** wherein said lens is hingedly secured to said lens mount to be selectively positioned between operative and inoperative positions, and wherein the lamp inserting step includes placing said lens in its inoperative position rendering said socket accessible from below said lens mount prior to inserting said lamp base through said openings in said generally horizontal panel and said lens mount and into said socket, and thereafter placing said lens in said operative position to enclose the light emitting portion of said lamp within said lens.

49. The method of claim **48** further comprising the step of:

sealingly engaging a gasket located between an upper rim of the lens and the lens mount when the lens is in the operative position.

50. The method of installing a canopy luminaire of claim **48** further including the step of relamping said luminaire comprising:

moving said lens from its operative position to its inoperative position to render an installed lamp having its base engaged in the socket accessible from below said lens mount, removing said installed lamp in said luminaire from a point below said lens mount, thereafter installing a new lamp in said luminaire from a point below said lens mount by inserting the base thereof through said generally horizontal panel and lens mount openings into the socket, and returning said lens to its operative position enclosing said light emitting portion of the new lamp.

51. The method of installing a canopy luminaire of claim **50** wherein the step of moving the lens from its operative position to its inoperative position includes disengaging a clasp, which in its engaged position maintains said lens in its operative position, and swinging said lens downwardly about said hinge to its inoperative position, and wherein the step of moving said lens from its inoperative position to its operative position after installing a new lamp includes

swinging said lens about said hinge upwardly to its operative position wherein said clasp is engaged to maintain said lens in its operative position.

52. The method of installing a canopy luminaire of claim **51** wherein the step of disengaging the clasp includes engaging a clasp disengaging element located on the end of a pole with said clasp while manipulating the pole from the ground, and wherein the step of removing the installed lamp includes grasping said installed lamp with a lamp gripping element mounted on the end of a pole and manipulating the pole from the ground to disengage the lamp base from said socket and remove said lamp from said luminaire, and wherein the step of installing the new lamp includes grasping a new lamp with said lamp gripping element and manipulating the pole from the ground to insert the lamp base in said socket, and thereafter placing said lens in its operative position by engaging an end of a pole with either said lens or said clasp and manipulating the pole from the ground to swing said lens upwardly about said hinge to its operative position wherein said clasp is engaged to maintain said lens in its operative position.

53. The canopy luminaire of claim **41** wherein said lens has a vertical dimension substantially coextensive with the vertical dimension of the light emitting portion of said lamp.

54. The canopy luminaire of claim **53**, said compartment having a substantially circular opening formed in the lower surface thereof, wherein said substantially circular opening in said compartment, said substantially circular opening in said generally horizontal canopy panel, and said vertically oriented socket have a common axis.

55. The canopy luminaire of claim **41**, wherein the socket is located entirely above said lens mount.

56. The canopy luminaire of claim **41**, wherein the lens mount and the lens are dimensioned such that the lens mount and lens cannot pass through the canopy opening.

57. The canopy luminaire of claim **56**, wherein the canopy opening defines a first major horizontal dimension and the lens includes an upper edge defining a second major horizontal dimension and the first major horizontal dimension is less than the second major horizontal dimension.

58. The canopy luminaire of claim **56**, wherein the canopy opening defines a first horizontal area and the lens includes an upper edge defining a second horizontal area and the first horizontal area is less than the second horizontal area.

59. The canopy luminaire of claim **41**, wherein said lamp is a high intensity discharge lamp.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,059,422
DATED : May 9, 2000
INVENTOR(S) : Fischer et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 1,
Line 42, reads “from the ED lamp” and should read -- from the HID lamp --.

Column 4,
Lines 20 and 53, read “cross-section” and should read -- cross section --.
Line 23, reads “upper portion FIG. 2” and should read -- upper portion of FIG. 2 --.
Line 34, reads “portion of the FIG. 7” and should read -- portion of FIG. 7 --.

Column 5,
Line 66, reads “cross-section” and should read -- cross section --.

Column 7,
Line 25, reads “A pair spring clips” and should read -- A pair of spring clips --.
Line 26, reads “are secured at” and should read -- is secured at --.

Column 8,
Line 52, reads “to FIG. 7 and 8” and should read -- to FIGS. 7 and 8 --.

Column 9,
Line 4, reads “well known in the ark” and should read -- well known in the art --.
Line 55, reads “comers 246” and should read -- corners 246 --.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,059,422
DATED : May 9, 2000
INVENTOR(S) : Fischer et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 10,
Line 10, reads “comer 246” and should read -- corners 246 --.
Line 29, reads “description of a several” and should read -- description of several --.
Line 31, reads “applicant” and should read -- applicants --.
Line 38, reads “applicant’s” and should read -- applicants’ --.
Line 55, reads “to fixedly securement said” and should read -- to fixedly secure said --.

Signed and Sealed this

Twenty-seventh Day of August, 2002

Attest:

JAMES E. ROGAN
Director of the United States Patent and Trademark Office

Attesting Officer

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,059,422
DATED : May 9, 2000
INVENTOR(S) : Fischer et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 1,
Line 18, reads “discharge (HID)) lamps” and should read -- discharge (HID)) lamps --.
Line 42, reads “from the ED lamp” and should read -- from the HID lamp --.

Column 2,
Line 44, reads “clip is based outwardly” and should read -- clip is biased outwardly --.

Column 4,
Lines 20 and 53, read “cross-section” and should read -- cross section --.
Line 23, reads “upper portion FIG. 2” and should read -- upper portion of FIG. 2 --.
Line 34, reads “portion of the FIG. 7” and should read -- portion of FIG. 7 --.

Column 5,
Line 66, reads “cross-section” and should read -- cross section --.

Column 7,
Line 25, reads “A pair spring clips” and should read -- A pair of spring clips --.
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Line 52, reads “to FIG. 7 and 8” and should read -- to FIGS. 7 and 8 --.

Column 9,
Line 4, reads “well known in the ark” and should read -- well known in the art --.
Line 55, reads “comers 246” and should read -- corners 246 --.

Column 10,
Line 10, reads “comer 246” and should read -- corners 246 --.
Line 29, reads “description of a several” and should read -- description of several --.
Line 31, reads “applicant” and should read -- applicants --.
Line 38, reads “applicant’s” and should read -- applicants’ --.
Line 55, reads “to fixedly securement said” and should read -- to fixedly secure said --.

Column 11,
Line 32, reads “with all outer” and should read -- with an outer --.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,059,422
DATED : May 9, 2000
INVENTOR(S) : Fischer et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 12,
Line 32, reads "comers" and should read -- corners --.
Line 46, reads "temporary retainer;" and should read -- temporary retainer; and --.
Line 53, reads "method claim of 18" and should read -- method of claim 18 --.
Line 56, reads "includes tie steps of:" and should read -- includes the steps of: --.
Line 60, reads "trough" and should read -- through --.

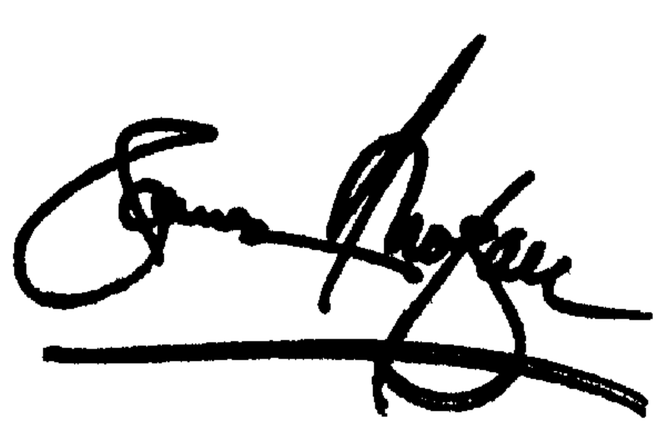
Column 15,
Line 41, reads "located in compartment" and should read -- located in said compartment --.

Column 16,
Line 17, reads "luminaire claim 45" and should read -- luminaire of claim 45 --.

This certificate supersedes Certificate of Correction issued August 22, 2002.

Signed and Sealed this

Tenth Day of December, 2002



JAMES E. ROGAN
Director of the United States Patent and Trademark Office